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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,063	03/31/2005	Philippe Meunier-Beillard	BE02 0027 US	6267

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EXAMINER	
ESTRADA, MICHELLE	
ART UNIT	PAPER NUMBER
2823	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,063	MEUNIER-BEILLARD ET AL.	
	Examiner	Art Unit	
	Michelle Estrada	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 17-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 17-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Coleman (5,155,062).

Re claim 1, Coleman discloses depositing an epitaxial layer based on Group IV elements, silicon carbide, on a silicon substrate by Chemical Vapor Deposition using source gases (See abstract), and including employing nitrogen as a carrier gas (Col. 1, lines 35-45).

Re claim 2, Coleman discloses forming an epitaxial layer based on at least one of the following silicon and carbon.

Re claim 3, Coleman discloses wherein the epitaxial layer comprises $Si_{1-y}C_y$.

Re claim 6, Coleman discloses wherein the epitaxial layer comprises a silicon epitaxial layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 6, 8 and 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klumpp et al. (non-patent literature) in view of the following comments.

Re claim 1, Klumpp et al. discloses depositing an epitaxial layer based on Group IV elements, silicon carbide, on a silicon substrate by Chemical Vapor Deposition at a low temperature in the range of 200-300 °C (See Introduction), and including employing argon as a carrier gas (abstract). The Examiner takes official notice that the use of source gases for depositing a layer is well known in the art at the time of the invention. It would have been within the scope of one of ordinary skill in the art at the time of the invention to use the well-known source gases in order to obtain a deposited layer.

Re claim 2, Klumpp et al. discloses forming an epitaxial layer based on at least one of the following silicon and carbon.

Re claim 3, Klumpp et al. discloses wherein the epitaxial layer comprises $Si_{1-y}C_y$.

Re claim 6, Klumpp et al. discloses wherein the epitaxial layer comprises a silicon epitaxial layer.

Re claim 8, Klumpp et al. discloses wherein the depositing is carried out at a temperature of about 450 °C-1000 °C, having a range that overlaps being less than 600 °C.

Re claim 17, Coleman discloses wherein the depositing is carried out at a temperature of about 450 °C-1000 °C, having a range that overlaps being less than 600 °C.

Re claim 20, Coleman discloses wherein the depositing is carried out at a temperature of about 450 °C-1000 °C, having a range that overlaps being less than 600 °C.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coleman as applied to claims 1-3 and 6 above, and further in view of Kaeppeler et al. (WO 01/14619).

Re claims 4 and 5, Coleman does not disclose wherein the epitaxial layer comprises a SiGe epitaxial layer.

Kaeppeler et al. disclose the deposition of a SiC or SiCGe semiconductor layers by means of a CVD (Abstract).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Coleman and Kaeppeler et al. to enable the semiconductor material of Coleman to be the same according to the teachings of Kaeppeler because one of ordinary skill in the art would have been motivated to look to alternative suitable materials for the disclosed semiconductor formation step of Coleman and art recognized

suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, Kaeppeler et al. disclose SiCGe as a suitable material to be deposited by CVD.

Re claim 5, Kappeler et al. disclose wherein the epitaxial layer comprises SiGeC.

Claims 7, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coleman in view of Kaeppeler et al. as applied to claims 4 and 5 above, and further in view of Kobayashi et al. (non-patent literature).

Re claims 7, 18 and 19, the combination does not disclose the method carried out at a temperature of less than about 600 °C, and using hydrogen as the carrier gas.

Kobayashi et al. disclose depositing an epitaxial layer based on Group IV elements (Ge) on a silicon substrate by CVD, and including employing hydrogen or argons as a carrier gas (abstract); wherein the CVD process is carried out at 350 °C, which is less than 600 °C.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Coleman, Kaeppeler et al, and Kobayashi et al. to enable the CVD temperature step of the combination to be performed according to the teachings of Kobayashi et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed CVD temperature step of the combination and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, at this

temperature you will obtain high-quality heterostructures, epitaxial growth selectivity is perfect and the nucleation is controlled (See Introduction of Kobayashi et al.).

Response to Arguments

Applicant's arguments filed 12/14/06 have been fully considered but they are not persuasive. Applicant argues that Coleman reference indicates that nitrogen can be present in the source and carrier gases, that the cited portions do not teach using nitrogen as the actual carrier gas for a source gas used in a CVD process. However, Coleman teaches using nitrogen as the carrier gas and additional teachings of the reference does not render invalid the teachings relied on.

Applicant argues that Coleman teaches away from using nitrogen in any source or carrier gas to avoid contamination. However, Coleman does not teach away because his advantages are other than the present invention. It is not necessary for the reference to disclose that the process of the reference is performed to achieve the same goals as applicant or to obtain the same advantages recognized by applicant. It is sufficient that the process suggested by the reference alone or in combination with the remaining references is encompassed by the instant claims.

Applicant argues that Klumpp teaches away because he uses a liquid source instead of a gas source. However, Klumpp does not teach away, Klumpp is teaching "another way", using liquid instead of gas, but the result is the same.

Applicant argues that Kobayashi does not disclose a CVD at a temperature less than 600 °C. However, Applicant is directed to the Introduction where he explains that

the growing of the layer is done when the substrate reaches a temperature of 350 °C. The fact that he heats the substrate first and then cooled it down does not affect the growing of the layer.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michelle Estrada
Primary Examiner
Art Unit 2823

ME
March 13, 2007